

BEFORE THE BOARD OF ENVIRONMENTAL REVIEW
OF THE STATE OF MONTANA

In the matter of the adoption) NOTICE OF ADOPTION AND
of new rules I through IX and) REPEAL
the repeal of ARM 17.36.901)
through 17.36.903 and)
17.36.907 through 17.36.910) (WATER QUALITY)
pertaining to Subsurface)
Wastewater Treatment Systems)

TO: All Concerned Persons

1. On October 17, 2002, the Board of Environmental Review published MAR Notice No. 17-176 regarding a notice of public hearing on the proposed adoption and repeal of the above-stated rules at page 2761, 2002 Montana Administrative Register, issue number 19.

2. The Board has adopted new rules I (17.36.911), II (17.36.912), III (17.36.913), IV (17.36.914), V (17.36.916), VII (17.36.920) and VIII (17.36.922) and repealed 17.36.901 through 17.36.903 and 17.36.907 through 17.36.910 exactly as proposed. The Board has adopted new rule VI (17.36.918) as proposed, but with the following changes.

NEW RULE VI (17.36.918) HORIZONTAL SETBACKS, FLOODPLAINS (1) through (3) remain as proposed.

(4) Sealed components of wastewater treatment systems, if located within a 100-year floodplain, must be designed and constructed to prevent surface water and ground water inundation, and pump lines must be pressure tested prior to use. ~~The minimum test pressure must be five times the operation pressure.~~ Pipes must have a pressure rating of at least two times the operating pressure or pump shutoff pressure, whichever is greater. Pipes must be tested at 1½ times the operating pressure or pump shutoff pressure, whichever is greater, or must be tested as specified by the manufacturer.

3. The following comments were received and appear with the Board's responses. Amendments have been made to the DEQ-4 Circular in response to the comments set forth below:

New Rule I (17.8.911)

COMMENT NO. 1: The definition of "bedrock" should not include a reference to hand tools because no one should enter a test pit 8 feet deep to dig with hand tools.

RESPONSE: The reference to hand tools in the definition is needed to indicate one standard for identifying material that does not provide for adequate treatment of wastewater. The commentor correctly notes that no one should enter a test pit that is not constructed to meet safety standards.

COMMENT NO. 2: The definition of "impervious layer" should be changed to reference a permeability limit rather than a percolation rate.

RESPONSE: This definition uses percolation rate because it is easier for the evaluator to obtain than the permeability of the soils.

New Rules II (17.36.912), IV (17.36.914), V (17.36.916)

COMMENT NO. 3: New Rules II, IV, V, and others refer to DEQ-4, 2002 edition. DEQ should consider deleting the year and just stating the current edition.

RESPONSE: When agency rules incorporate a document by reference, the Montana Administrative Procedures Act requires that the agency identify a specific edition of the document.

New Rule VI(4) (17.36.914)

COMMENT NO. 4: DEQ should consider testing to 1 ½ times the shutoff head pressure of the pump. Five times the operating pressure could burst the specified pipes.

RESPONSE: The language will be changed to the following: "Pipes must have a pressure rating of at least two times the operating pressure or pump shutoff pressure, whichever is greater. Pipes must be tested at 1½ times the operating pressure or pump shutoff pressure, whichever is greater, or must be tested as specified by the manufacturer."

DEQ-4

Chapter 4, Section 4.3.3.2

COMMENT NO. 5: Is it correct that fill can be used to overcome a depth to groundwater problem but not bedrock or an impervious layer? The Circular needs a definition for "limiting layer".

RESPONSE: Fill can be used to overcome any of the limiting layers (groundwater, bedrock, or an impervious layer) for replacement drainfields only. See DEQ-4 Chapter 4 (introduction), and ARM 17.36.321(4). "Limiting layer" is defined in the rules at ARM 17.36.101(21). This definition includes groundwater, bedrock, and an impervious layer.

Chapter 5, Section 5.2.2

COMMENT NO. 6: Does this section mean that DEQ is not using peak flow for design? Sand filters in particular will suffer if the system is under-used.

RESPONSE: The design must be based on peak flow to prevent hydraulic overload of the system. However, as an alternative to using the tables, DEQ-4 does allow design based on actual water use data collected from similar facilities.

Chapter 7, Section 7.2.10

COMMENT NO. 7: In the proposed Circular DEQ-4, the sizing of septic tanks for residential use is based on commercially available septic tank sizes. In 2002, EPA published the Onsite Wastewater Treatment Systems Manual, which referenced septic tank sizing based on the International Private Sewage Disposal Code, 1995 version. The commentor would like these tank volumes to be acceptable for sizing residential septic tanks.

RESPONSE: The following language has been added:

"F. Septic tank volume may be sized using nationally recognized plumbing codes, provided that there is adequate volume to store at least 3.5 times the estimated daily wastewater flow, and the sizing is approved by the reviewing authority."

Chapter 8, Section 8.8.1

COMMENT NO. 8: Why did DEQ not propose Schedule 80 pipe?

RESPONSE: The task force recommended Schedule 40 as adequate for piping leading into and out of the septic tank.

Chapter 9 and 11

COMMENT NO. 9: A standard trench design does not address systems installed from less than 12 inches deep to at-grade. The commentor recommends that a shallow-capped system be incorporated into the Circular, possibly in chapter 11.

RESPONSE: The following language will be added to Section 11.4.1: "The ground surface where the system is to be placed must be plowed, scarified, or trenched less than 12 inches in depth. Trenching is preferred to plowing or scarifying to prevent horizontal migration of the effluent."

Section 9.3

COMMENT NO. 10: The term "discharge pipe" should be added to the definitions.

RESPONSE: The following language will be added ". . . discharge pipe (pipe leading from the septic tank or dose tank to the distribution lines)"

Section 9.4

COMMENT NO. 11: DEQ should have at least 5 psi for orifices 1/8-inch or smaller.

RESPONSE: The following language will be added: "For orifices smaller than 3/16-inch, the minimum pressure must be 2.16 psi (5 feet of head) at the end of each distribution line."

COMMENT NO. 12: DEQ should consider changing the minimum pressure of 1 psi (2.3 feet of head) to 2.16 psi (5 feet of head) at the end of the distribution lines. Even with effluent filters, the distribution lines can and do become clogged with a biofilm. This biofilm is caused by an inadequate scouring velocity and/or too low of an orifice pressure. Increasing the minimum orifice design pressure would not only increase the orifice pressure but also increase the scouring velocity of the entire distribution system and keep everything clean.

RESPONSE: This change will be made for orifices smaller than 3/16-inch as indicated in the response above.

Section 9.8.1

COMMENT NO. 13: The commentor agrees with the change regarding reserve storage volume, but asked if the reviewer would make the decision on what reserve volume is required.

RESPONSE: The reviewer will evaluate and approve the proposed reserve storage volume based on compliance with this section.

Section 12.1

COMMENT NO. 14: The commentor is not convinced that sand lined trenches help with slow-permeable soils.

RESPONSE: The reference to slow-permeable soils will be deleted.

Section 13.2 4

COMMENT NO. 15: Is there sufficient evidence to allow a twenty-five percent reduction for gravelless chambers?

RESPONSE: Montana has allowed 25-30% reduction for drainfields since 2000. Some counties have allowed gravelless chambers for at least 5 years without any increases in failure rates. One county has allowed chambers for drainfields that would require 90 to 150 lineal feet of standard pipe and drainrock. The county has not experienced any failures of drainfields that have been installed with a 25% reduction.

A recent study in Oregon of almost 400 systems indicated no difference in surface failure rates between chambers and gravel systems when the loading rate was 2.0 times for chamber systems (King et al, 2002, Surface Failure Rates of Chamber and Traditional Aggregate-Laden Trenches in Oregon, Small Flows Quarterly, Fall 2002, pages 27-35). Several studies at the Colorado School of Mines evaluated chamber systems for hydraulic loading and effluent treatment. The throughput of the aggregate-free (chamber) systems was 2.4 times that of the aggregate-laden (gravel) systems. (Lowe and Siegrist, 2000, Evaluation of Soil Infiltration Rates for Septic Tank Effluent as Affected by Aggregate-Free versus Aggregate-Laden Infiltrative Surfaces). Another Colorado School of Mines study compared the performance of gravel trenches to chamber systems loaded at a higher rate simulating a 40% trench length reduction. This study concluded that aggregate-free and aggregate-laden did not exert a measurable effect on hydraulic and purification performance (Van Cuyk et. al. 2001, Hydraulic and Purification Behaviors and their interactions during Wastewater Treatment in Soil Infiltration System, Water Resources Journal Vol. 35). Another study by North Carolina State University indicated no evidence that failure rates were different for chamber and gravel systems with a 40% reduction in chamber system sizing (1997 ASTM, Dix and May, A Review of the Field Performance of the Infiltrator Chamber Leaching System).

Chapter 14

COMMENT NO. 16: The commentor recommends using the former Circular WQB-5 sizing criteria for mound systems to prevent abnormally large mound designs.

RESPONSE: The basal and hydraulic loading rates are based on the 2000 Wisconsin Mound Manual referenced in Section 14.2.1 rather than the former Circular WQB-5. The sand loading rate of 1.0 gpd/sq.ft. is based on recommendations in the 2000 manual for mounds.

Section 14.1.1

COMMENT NO. 17: This section requires separation distances to be measured from the outside of the mound where the topsoil meets the ground surface. The commentor recommends changing this to a distance from the outside trench wall or other identifiable component so as not to penalize owners of mounds that taper the edge of the mound to blend with the landscape.

RESPONSE: The following clarification will be added: "Separation distances must be measured from the outside of the mound where the topsoil fill meets the natural ground surface or, if the design uses a lesser slope for landscaping purposes, where the toe of the mound would be if the 3:1 slope specified in Section 14.2.7 were used."

Section 15.1

COMMENT NO. 18: Should downsizing the drainfield be 50% for all soils?

RESPONSE: The task force recommended this soils restriction for downsizing drainfields after an intermittent sand filter because soils with slow percolation rates cannot accept effluent, even treated effluent, at the same rate as faster percolating soils.

Section 16.1.1

COMMENT NO. 19: The drainfield after a recirculating sand filter should be downsized 50% if the owner of the system has a maintenance contract with an expert with experience in recirculating sand filter operation.

RESPONSE: A 50% reduction is allowed for soils with a percolation rate of between 3 and 60 minutes per inch. The requirement for an operation and maintenance plan with a service contract for on-going service and maintenance required for the life of the system is also specified in Section 16.2.15 and Appendix D. A requirement that the service

provider be an expert with experience in sand filter operation has merit, but the Circular does not include such a requirement because of the difficulty in identifying a single standard for the expert qualifications.

Section 16.2.10

COMMENT NO. 20: The spacing of one orifice for each 4 square feet of filter is not necessary. An operating filter with 6 ft²/orifice has excellent effluent quality.

RESPONSE: The task force has recommended this spacing for orifices based on their experience with other operating systems. The 2002 EPA Manual states that smaller dose volumes are preferred because the flow through the porous media will occur under unsaturated conditions. Better wastewater media contact and longer residence time occur under these conditions, which results in better treatment. Greater spacing between orifices could result in filters that are unnecessarily large or in saturation of the area around each orifice, which would limit the spread of effluent throughout the media.

Chapters 17, 20, 21, 22

COMMENT NO. 21: The commentor recommends changing the requirement for providing data for new technology systems for three systems, with six cumulative years of data. This requirement is very restrictive. The commentor suggests that the Circular should recognize nationally accepted scientific evidence of performance in similar climatic conditions, or other evidence approved by the department.

RESPONSE: The department had already removed the six-year requirement from Chapter 17 and 21. However, the task force recommended that the requirement be retained for aerobic treatment units and experimental systems to verify performance of the different types of systems within these categories. Manufacturers can request a deviation from this requirement if other acceptable data is provided. The department and a nondegradation task force are currently working on data requirements for Level II treatment systems and may modify this section in the future to include the revised sampling requirements.

Chapter 24

COMMENT NO. 22: The commentor does not like holding tanks and believes other requirements should be waived to allow the installation of systems other than holding tanks.

RESPONSE: The task force has determined that holding tanks should be used only in very limited cases. These cases include seasonal use facilities where pumping costs would not be prohibitive. Other cases include holding tanks for RV dump stations, which are often located near surface water at RV parks. Discharging high strength wastewater from RVs to a drainfield could result in premature failure of the drainfield and wastewater discharges to surface waters. Using a holding tank instead of a drainfield would contain the effluent until the effluent could be pumped and treated at a public wastewater system located farther from surface water.

COMMENT NO. 23: The commenter wants individual owners, as well as government entities, to be allowed to have holding tanks for RV dump stations.

RESPONSE: The rule does allow individual owners to have a holding tank for a dump station if the station is located at a facility licensed by the Department of Public Health and Human Services and inspected by the local health department. The second sentence in Section 24.1 in Circular DEQ-4, "Holding tanks are for seasonal use structures (facility) and do not meet criteria for lifting of sanitary restrictions", will be removed to reflect the new provisions for holding tanks.

Chapter 27(8)

COMMENT NO. 24: The commentor believes that groundwater depth should be addressed in this section.

RESPONSE: The separation distance to groundwater is addressed in the rules under New Rule V (25 feet to groundwater) and it is not necessary to repeat it in the design circular.

Reviewed by:

BOARD OF ENVIRONMENTAL REVIEW

_____ By: _____

JAMES M. MADDEN
Rule Reviewer

JOSEPH W. RUSSELL, M.P.H.
Chairman

Certified to the Secretary of State, _____, 2003.